

Please amend the present application as follows:

Claims

Please amend the claims as indicated below. The language being added is underlined (“ ”), and the language being deleted contains a strikethrough (“~~—~~”).

LISTING OF CLAIMS

1-4. (Canceled)

5. (Currently amended) In an asynchronous digital subscriber line (ADSL) system comprising a central office High Speed ADSL Terminating Unit (HSTU-C) in bi-directional discrete multitone (DMT) communication with a remote High Speed ADSL Terminating Unit (HSTU-R), a method for improving handshake detection comprising:

transmitting handshake signaling from the HSTU-C to the HSTU-R via a first subset of carrier sets at a first symbol rate; and

transmitting handshake signaling from the HSTU-C to the HSTU-R via a second subset of carrier sets at a second symbol rate, the second symbol rate being less than the first symbol rate~~The method as in Claim 1~~, wherein the handshake signaling is transmitted via the second subset of carrier sets at the second symbol rate after a handshake attempt between the HSTU-C and the HSTU-R performed at the first symbol rate for both the first and second subsets of carrier sets has failed.

6-10. (Canceled)

11. (Currently amended) In an asynchronous digital subscriber line (ADSL) system comprising a central office High Speed ADSL Terminating Unit (HSTU-C) in bi-directional discrete multitone (DMT) communication with a remote High Speed ADSL Terminating Unit (HSTU-R), a method for improving handshake detection comprising:

transmitting handshake signaling from the HSTU-C to the HSTU-R via a first subset of carrier sets at a first symbol rate;

transmitting handshake signaling from the HSTU-C to the HSTU-R via a second subset of carrier sets at a second symbol rate, the second symbol rate being less than the first symbol rate; and
~~The method as in Claim 1, further comprising the step of:~~

detecting, at the HSTU-R, a number of phase changes in a given time window of the handshake signaling transmitted by the HSTU-C via the second subset of carrier sets to identify the second symbol rate.

12. (Previously Presented) The method of Claim 11, further comprising the, step of; receiving, at the HSTU-C, at least one handshake symbol from the HSTU-R at an identified handshake symbol transmission rate.

13. (Previously Presented) The method as in Claim 11, wherein the step of detecting the number of phase changes in the given time window of the handshake signaling includes:

separating the handshake signaling transmitted by the HSTU-C into a first set of sub-symbols and a second set of sub-symbols for the given time window, the second set of sub-symbols following the first set of sub-symbols;

performing a fast fourier transform on each of the first set of sub-symbols;

performing a fast fourier transform on each of the second set of sub-symbols;

summing a result of the fast fourier transforms performed on the first set of sub-symbols;

summing a result of the fast fourier transforms performed on the second set of sub-symbols;

multiplying the summed result from the first set of sub-symbols with the summed result of the second set of sub-symbols to determine the number of phase changes in the handshake signaling within the given time window.

14. (Previously Presented) The method of Claim 13, wherein the number of phase changes detected within the given time window is proportional to the identified second symbol rate.

15. (Previously Presented) The method of Claim 13, wherein the second symbol rate is identified by the HSTU-R when the number of phase changes is at or above a minimum number of phase changes associated with the second symbol rate.

16. (Previously Presented) In an asynchronous digital subscriber line (ADSL) system comprising a central office High Speed ADSL Terminating Unit (HSTU-C) in bi-directional discrete multitone (DMT) communication with a remote High Speed ADSL Terminating Unit (HSTU-R), a method for improving handshake detection robustness comprising:

transmitting handshake signaling via a first subset of carrier sets of a DMT transmission bandwidth between the HSTU-C and
the HSTU-R at a first symbol rate;

determining a presence of near end cross talk (NEXT) in a second subset of carrier sets of the DMT transmission bandwidth; and

transmitting the at least one handshake symbol via the second subset of carrier sets at a second symbol rate so that at least one sub-symbol of the at least one handshake symbol transmitted over the second subset of carrier sets is substantially unaffected by the near end cross talk.

17. (Original) The method as in Claim 16, wherein the first symbol rate is 539.0625 symbols per second.

18. (Original) The method as in Claim 17, wherein the second symbol rate is 269.53125 symbols per second.

19. (Original) The method as in Claim 16, wherein the second symbol rate is 269.53125 symbols per second.

20. (Original) The method as in Claim 16, wherein the second subset of carrier sets includes carrier set C43.

21. (Original) The method as in Claim 16, wherein the second subset of carrier sets includes carrier set A43.

22-25. (Canceled)

26. (Currently amended) An asynchronous digital subscriber line (ADSL) system comprising:

a central office High Speed ADSL Terminating Unit (HSTU-C); and

a remote High Speed ADSL Terminating Unit (HSTU-R) in bi-directional discrete multitone (DMT) communication with the HSTU-C;

wherein the HSTU-C is adapted to:

transmit handshake signaling to the HSTU-R via a first subset of carrier sets at a first symbol rate;

transmit handshake signaling to the HSTU-R via a second subset of carrier sets at a second symbol rate, the second symbol rate being less than the first symbol rate; and

~~The ADSL system as in Claim 22, wherein the HSTU-C is further adapted to~~

transmit the handshake signaling via the second subset of carrier sets at the second symbol rate after a handshake attempt between the HSTU-C and the HSTU-R performed at the first symbol rate for both the, first and second subsets of carrier sets has failed.

27-31. (Canceled)

32. (Original) In an asynchronous digital subscriber line (ADSL) system comprising a central office High Speed ADSL Terminating Unit (HSTU-C) in bi-directional discrete multitone (DMT) communication with a remote High Speed ADSL Terminating Unit (HSTU-R), a method for improving handshake detection comprising:

detecting, at the HSTU-R, a number of phase changes in a given time window of a handshake signaling transmitted by the HSTU-C to identify a symbol rate of the handshake signaling.

33. (Original) The method of Claim 32, further comprising the step of:
transmitting an acknowledgement symbol from the HSTU-R to the HSTU-C at the identified symbol rate.

34. (Original) The method of Claim 32, further comprising the step of:
receiving, at the HSTU-C, at least one handshake symbol at the HSTU-R at the identified symbol rate.

35. (Previously Presented) The method as in Claim 32, wherein the step of detecting the number of phase changes in the given time window of the handshake signaling transmitted by the, HSTU-C to identify the symbol rate of the handshake signaling includes:

separating the handshake signaling transmitted by the HSTU-C into a first set of sub-symbols and a second set of sub-symbols for the given time window, the second set of sub-symbols following the first set of sub-symbols;

performing a fast fourier transform on each of the first set of sub-symbols;

performing a fast fourier transform on each of the second set of sub-symbols;

summing a result of the fast fourier transforms performed on the second set of sub-symbols;

summing a result of the fast fourier transforms performed on the second set of sub-symbols;

multiplying the summed result from the first set of sub-symbols with the summed result of the second set of sub-symbols to determine the number of phase changes of the handshake signaling within the given time window.

36. (Original) The method of Claim 32, wherein the number of phase changes detected within the time window is proportional to the identified symbol rate.

37. (Original) The method of Claim 32, wherein the identified symbol rate is identified by the HSTU-R when the number of phase changes is at or above a minimum number of phase changes associated with the identified symbol rate.